

NODE=M022

 $K_2^*(1430)$

$$I(J^P) = \frac{1}{2}(2^+)$$

We consider that phase-shift analyses provide more reliable determinations of the mass and width.

 $K_2^*(1430)$ MASS**CHARGED ONLY, WITH FINAL STATE $K\pi$**

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
1425.6± 1.5 OUR AVERAGE					Error includes scale factor of 1.1.
1420 ± 4	1587	BAUBILLIER	84B	HBC	—
					8.25 $K^- p \rightarrow \bar{K}^0 \pi^- p$
1436 ± 5.5	400	1,2 CLELAND	82	SPEC	+
1430 ± 3.2	1500	1,2 CLELAND	82	SPEC	+
1430 ± 3.2	1200	1,2 CLELAND	82	SPEC	—
1423 ± 5	935	TOAFF	81	HBC	—
					6.5 $K^- p \rightarrow \bar{K}^0 \pi^- p$
1428.0± 4.6		3 MARTIN	78	SPEC	+
1423.8± 4.6		3 MARTIN	78	SPEC	—
1420.0± 3.1	1400	AGUILAR...	71B	HBC	—
1425 ± 8.0	225	1,2 BARNHAM	71C	HBC	+
1416 ± 10	220	CRENNELL	69D	DBC	—
1414 ± 13.0	60	1 LIND	69	HBC	+
1427 ± 12	63	1 SCHWEING...	68	HBC	—
1423 ± 11.0	39	1 BASSANO	67	HBC	—
					4.6–5.0 $K^- p \rightarrow \bar{K}^0 \pi^- p$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1423.4± 2 ± 3	24809± 820	4 BIRD	89	LASS	—
					11 $K^- p \rightarrow \bar{K}^0 \pi^- p$

NODE=M022205

NODE=M022M1

NODE=M022M1

OCCUR=2

OCCUR=3

OCCUR=2

OCCUR=2

NEUTRAL ONLY

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1432.4± 1.3 OUR AVERAGE				
1431.2± 1.8± 0.7		5 ASTON	88	LASS
1434 ± 4 ± 6		5 ASTON	87	LASS
1433 ± 6 ± 10		5 ASTON	84B	LASS
1471 ± 12		5 BAUBILLIER	82B	HBC
1428 ± 3		5 ASTON	81C	LASS
1434 ± 2		5 ESTABROOKS	78	ASPK
1440 ± 10		5 BOWLER	77	DBC
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1428.5± 3.9	1786± 127	6 AUBERT	07AK BABR	10.6 $e^+ e^- \rightarrow K^{*0} K^{\pm} \pi^{\mp} \gamma$
1420 ± 7	300	HENDRICK	76	DBC
1421.6± 4.2	800	MCCUBBIN	75	HBC
1420.1± 4.3		7 LINGLIN	73	HBC
1419.1± 3.7	1800	AGUILAR...	71B	HBC
1416 ± 6	600	CORDS	71	DBC
1421.1± 2.6	2200	DAVIS	69	HBC

NODE=M022M4

NODE=M022M4

1 Errors enlarged by us to Γ/\sqrt{N} ; see the note with the $K^*(892)$ mass.

2 Number of events in peak re-evaluated by us.

3 Systematic error added by us.

4 From a partial wave amplitude analysis.

5 From phase shift or partial-wave analysis.

6 Systematic errors not estimated.

7 From pole extrapolation, using world $K^+ p$ data summary tape.

NODE=M022M;LINKAGE=D

NODE=M022M;LINKAGE=W

NODE=M022M;LINKAGE=B

NODE=M022M;LINKAGE=F

NODE=M022M;LINKAGE=P

NODE=M022M4;LINKAGE=NS

NODE=M022M;LINKAGE=C

$K_2^*(1430)$ WIDTH**CHARGED ONLY, WITH FINAL STATE $K\pi$**

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
98.5 ± 2.7 OUR FIT					Error includes scale factor of 1.1.
98.5 ± 2.9 OUR AVERAGE					Error includes scale factor of 1.1.
109 ± 22	400	8,9 CLELAND	82 SPEC	+	30 $K^+ p \rightarrow K_S^0 \pi^+ p$
124 ± 12.8	1500	8,9 CLELAND	82 SPEC	+	50 $K^+ p \rightarrow K_S^0 \pi^+ p$
113 ± 12.8	1200	8,9 CLELAND	82 SPEC	-	50 $K^+ p \rightarrow K_S^0 \pi^- p$
85 ± 16	935	TOAFFF	81 HBC	-	$6.5 K^- p \rightarrow \bar{K}^0 \pi^- p$
96.5 ± 3.8		MARTIN	78 SPEC	+	$10 K^\pm p \rightarrow K_S^0 \pi p$
97.7 ± 4.0		MARTIN	78 SPEC	-	$10 K^\pm p \rightarrow K_S^0 \pi p$
94.7 ± 15.1	1400	AGUILAR-...	71B HBC	-	3.9,4.6 $K^- p$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
98 ± 4 ± 4	25k	10 BIRD	89 LASS	-	$11 K^- p \rightarrow \bar{K}^0 \pi^- p$

NODE=M022210

NODE=M022W1

NODE=M022W1

OCCUR=2

OCCUR=3

OCCUR=2

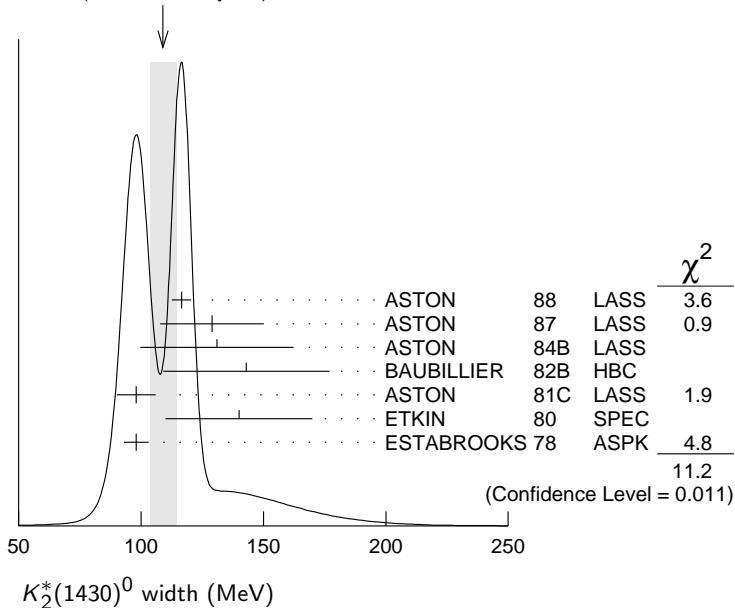
NEUTRAL ONLY

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
109 ± 5 OUR AVERAGE				Error includes scale factor of 1.9. See the ideogram below.
116.5 ± 3.6 ± 1.7	11 ASTON	88 LASS	11	$K^- p \rightarrow K^- \pi^+ n$
129 ± 15 ± 15	11 ASTON	87 LASS	11	$K^- p \rightarrow \bar{K}^0 \pi^+ \pi^- n$
131 ± 24 ± 20	11 ASTON	84B LASS	11	$K^- p \rightarrow \bar{K}^0 2\pi n$
143 ± 34	11 BAUBILLIER	82B HBC	8.25	$K^- p \rightarrow N K_S^0 \pi \pi$
98 ± 8	11 ASTON	81C LASS	11	$K^- p \rightarrow K^- \pi^+ n$
140 ± 30	11 ETKIN	80 SPEC	6	$K^- p \rightarrow \bar{K}^0 \pi^+ \pi^- n$
98 ± 5	11 ESTABROOKS 78	ASPK	13	$K^\pm p \rightarrow p K \pi$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
113.7 ± 9.2	1786 ± 127	12 AUBERT BABR	07AK	$10.6 e^+ e^- \rightarrow K^{*0} K^\pm \pi^\mp \gamma$
125 ± 29	300	8 HENDRICK	76 DBC	8.25 $K^+ N \rightarrow K^+ \pi N$
116 ± 18	800	MCCUBBIN	75 HBC	3.6 $K^- p \rightarrow K^- \pi^+ n$
61 ± 14	13 LINGLIN	73 HBC	2-13	$K^+ p \rightarrow K^+ \pi^- X$
116.6 ± 10.3	1800	AGUILAR-...	71B HBC	3.9,4.6 $K^- p$
144 ± 24.0	600	8 CORDS	71 DBC	9 $K^+ n \rightarrow K^+ \pi^- p$
101 ± 10	2200	DAVIS	69 HBC	12 $K^+ p \rightarrow K^+ \pi^- \pi^+ p$

NODE=M022W4

NODE=M022W4

WEIGHTED AVERAGE
109±5 (Error scaled by 1.9)

8 Errors enlarged by us to $4\Gamma/\sqrt{N}$; see the note with the $K^*(892)$ mass.

9 Number of events in peak re-evaluated by us.

10 From a partial wave amplitude analysis.

11 From phase shift or partial-wave analysis.

12 Systematic errors not estimated.

13 From pole extrapolation, using world $K^+ p$ data summary tape.

NODE=M022W;LINKAGE=D
 NODE=M022W;LINKAGE=W
 NODE=M022W;LINKAGE=F
 NODE=M022W;LINKAGE=P
 NODE=M022W4;LINKAGE=NS
 NODE=M022W;LINKAGE=C

K₂^{*}(1430) DECAY MODES

Mode	Fraction (Γ_i/Γ)	Scale factor/ Confidence level
Γ_1 $K\pi$	(49.9±1.2) %	
Γ_2 $K^*(892)\pi$	(24.7±1.5) %	
Γ_3 $K^*(892)\pi\pi$	(13.4±2.2) %	
Γ_4 $K\rho$	(8.7±0.8) %	S=1.2
Γ_5 $K\omega$	(2.9±0.8) %	
Γ_6 $K^+\gamma$	(2.4±0.5) × 10 ⁻³	S=1.1
Γ_7 $K\eta$	(1.5 ^{+3.4} _{-1.0}) × 10 ⁻³	S=1.3
Γ_8 $K\omega\pi$	< 7.2 × 10 ⁻⁴	CL=95%
Γ_9 $K^0\gamma$	< 9 × 10 ⁻⁴	CL=90%

CONSTRAINED FIT INFORMATION

An overall fit to the total width, a partial width, and 10 branching ratios uses 31 measurements and one constraint to determine 8 parameters. The overall fit has a $\chi^2 = 20.2$ for 24 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients $\langle \delta p_i \delta p_j \rangle / (\delta p_i \cdot \delta p_j)$, in percent, from the fit to parameters p_i , including the branching fractions, $x_i \equiv \Gamma_i / \Gamma_{\text{total}}$. The fit constrains the x_i whose labels appear in this array to sum to one.

x_2	-9						
x_3	-40	-73					
x_4	-8	36	-52				
x_5	-11	-3	-26	-7			
x_6	-1	-1	-1	-1	0		
x_7	-4	-7	-5	-5	-2	0	
Γ	0	0	0	0	0	-13	0
	x_1	x_2	x_3	x_4	x_5	x_6	x_7

Mode	Rate (MeV)	Scale factor
Γ_1 $K\pi$	49.1 ± 1.8	
Γ_2 $K^*(892)\pi$	24.3 ± 1.6	
Γ_3 $K^*(892)\pi\pi$	13.2 ± 2.2	
Γ_4 $K\rho$	8.5 ± 0.8	1.2
Γ_5 $K\omega$	2.9 ± 0.8	
Γ_6 $K^+\gamma$	0.24 ± 0.05	1.1
Γ_7 $K\eta$	0.15 ^{+0.33} _{-0.10}	1.3

K₂^{*}(1430) PARTIAL WIDTHS

$\Gamma(K^+\gamma)$			Γ_6
VALUE (keV)	DOCUMENT ID	TECN	CHG
241±50 OUR FIT	Error includes scale factor of 1.1.		
240±45	CIHANGIR 82 SPEC	+ 200	$K^+ Z \rightarrow Z K^+ \pi^0$, $Z K_S^0 \pi^+$

$\Gamma(K^0\gamma)$		Γ_9
VALUE (keV)	CL%	NODE=M022W9
< 5.4	90	NODE=M022W9
ALAVI-HARATI02B	KTEV	
$K + A \rightarrow K^* + A$		
• • • We do not use the following data for averages, fits, limits, etc. • • •		
<84	90	CARLSMITH 87 SPEC 0 60–200 $K_L^0 A \rightarrow$ $K_S^0 \pi^0 A$

NODE=M022215; NODE=M022

DESIG=1

DESIG=2

DESIG=6

DESIG=3

DESIG=4

DESIG=8

DESIG=5

DESIG=7

DESIG=10; OUR EVAL; → UNCHECKED ←

K*(1430) BRANCHING RATIOS

$\Gamma(K\pi)/\Gamma_{\text{total}}$

VALUE	DOCUMENT ID	TECN	CHG	COMMENT	Γ_1/Γ
0.499±0.012 OUR FIT					
0.488±0.014 OUR AVERAGE					

0.485±0.006±0.020 ¹⁴ ASTON 88 LASS 0 $11 K^- p \rightarrow K^- \pi^+ n$
 0.49 ± 0.02 ¹⁴ ESTABROOKS 78 ASPK ± $13 K^\pm p \rightarrow p K\pi$

$\Gamma(K^*(892)\pi)/\Gamma(K\pi)$

VALUE	DOCUMENT ID	TECN	CHG	COMMENT	Γ_2/Γ_1
0.496±0.034 OUR FIT					
0.47 ± 0.04 OUR AVERAGE					

0.44 ± 0.09 ASTON 84B LASS 0 $11 K^- p \rightarrow \bar{K}^0 2\pi n$
 0.62 ± 0.19 LAUSCHER 75 HBC 0 $10,16 K^- p \rightarrow K^- \pi^+ n$
 0.54 ± 0.16 DEHM 74 DBC 0 $4.6 K^+ N$
 0.47 ± 0.08 AGUILAR-... 71B HBC $3.9,4.6 K^- p$
 0.47 ± 0.10 BASSANO 67 HBC -0 $4.6,5.0 K^- p$
 0.45 ± 0.13 BADIER 65C HBC - $3 K^- p$

$\Gamma(K\omega)/\Gamma(K\pi)$

VALUE	DOCUMENT ID	TECN	CHG	COMMENT	Γ_5/Γ_1
0.059±0.017 OUR FIT					
0.070±0.035 OUR AVERAGE					

0.05 ± 0.04 AGUILAR-... 71B HBC $3.9,4.6 K^- p$
 0.13 ± 0.07 BASSOMPIE... 69 HBC 0 $5 K^+ p$

$\Gamma(K\rho)/\Gamma(K\pi)$

VALUE	DOCUMENT ID	TECN	CHG	COMMENT	Γ_4/Γ_1
0.174±0.017 OUR FIT	Error includes scale factor of 1.2.				
0.150^{+0.029}_{-0.017} OUR AVERAGE					

0.18 ± 0.05 ASTON 84B LASS 0 $11 K^- p \rightarrow \bar{K}^0 2\pi n$
 0.02^{+0.10}_{-0.02} DEHM 74 DBC 0 $4.6 K^+ N$
 0.16 ± 0.05 AGUILAR-... 71B HBC $3.9,4.6 K^- p$
 0.14 ± 0.10 BASSANO 67 HBC -0 $4.6,5.0 K^- p$
 0.14 ± 0.07 BADIER 65C HBC - $3 K^- p$

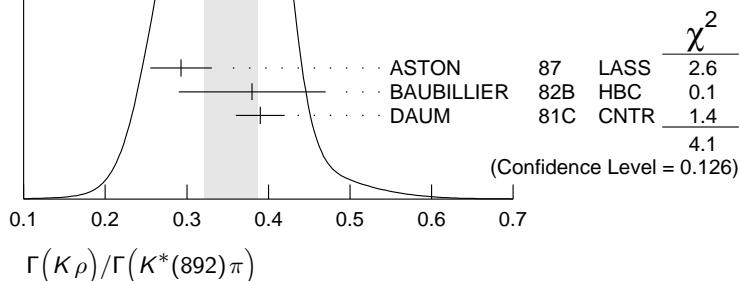
$\Gamma(K\rho)/\Gamma(K^*(892)\pi)$

VALUE	DOCUMENT ID	TECN	CHG	COMMENT	Γ_4/Γ_2
0.350±0.031 OUR FIT	Error includes scale factor of 1.4.				
0.354±0.033 OUR AVERAGE	Error includes scale factor of 1.4. See the ideogram below.				

0.293±0.032±0.020 ASTON 87 LASS 0 $11 K^- p \rightarrow \bar{K}^0 \pi^+ \pi^- n$
 0.38 ± 0.09 BAUBILLIER 82B HBC 0 $8.25 K^- p \rightarrow NK_S^0 \pi\pi$
 0.39 ± 0.03 DAUM 81C CNTR $63 K^- p \rightarrow K^- 2\pi p$

WEIGHTED AVERAGE
 0.354 ± 0.033 (Error scaled by 1.4)

Values above of weighted average, error,
 and scale factor are based upon the data in
 this ideogram only. They are not neces-
 sarily the same as our 'best' values,
 obtained from a least-squares constrained fit
 utilizing measurements of other (related)
 quantities as additional information.



NODE=M022225

NODE=M022R1

NODE=M022R1

NODE=M022R4

NODE=M022R4

NODE=M022R5
NODE=M022R5

OCCUR=2

NODE=M022R6
NODE=M022R6

NODE=M022R7
NODE=M022R7

